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ABSTRACT

This study (condensed from an unpublished doctoral dissertation, "Teacher-Child Interaction: A Study of the Relationships between Child-Initiated Questions and Nursery School Teacher Behavior," Wayne State University, 1966) examines the teaching and learning processes set in motion when four-year-old children question their teachers in nursery school classrooms. Thirteen girls, 13 boys, and eight teachers, in two middle class nursery schools were observed on a rotated time and program area schedule. Verbatim recordings were made of child-teacher-child interactions and coded to permit systematic comparisons of the form, function, and content of the children's questions and the teachers' responses. Results are presented in two parts: (1) methodological problems and (2) patterns of relationships between acts of instigation, acts of teaching, and child response. Major findings include a delineation of differences by sex in the kinds of questions asked, differences evoked in structured and unstructured situations, different response patterns used by teachers for initial questions rather than reciprocal questions and different response patterns used for answers to typically boy or girl questions. The study suggests that teachers reinforce their position as a prime verbal source of information and that they need to increase their skill in helping children learn how to learn by helping them pose relevant questions in a more orderly sequence. (WY)

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RELATIONSHIPS BETWEEN CHILDREN'S QUESTIONS AND NURSERY SCHOOL TEACHERS' RESPONSES*

Dorothy Haupt

Throughout the early years as children actively seek to satisfy their curiosity and to expand their fund of information, adults are in a key position to either enhance or stultify this quest for knowledge and understanding of their physical, social, and symbolic worlds. The nature and extent of adult guidance and support of young children's motivation to learn and to cope with the complexities of their environments depends, in part, upon the adult's concept of the roles and activities of a teacher and the roles and activities of a learner in the teaching-learning process.

That young children ask countless questions of why, when, where, what, how about the world of people, events, symbols, objects, and phenomena of the physical and scientific world is easily verified. They use this form of instigation as an efficient and convenient means of initiating contact with adults, for acquiring information, for corroborating and affirming facts already possessed; or they may use questions to indicate confusion and concern over gaps in their knowledge and comprehension. One of the problems confronting children is that of gauging the receptivity of individual adults to their questions and self-instituted explorations. In some instances it may be a matter of timing. That is, the child's sensitivity to the opportune time to initiate interaction with the adult may affect the nature of the response.

The variety of responses from adults are many. The nursery school teacher, for example, may elect to reinforce the child's observations and suppositions by giving a direct verbal answer or by nonverbal acknowledgment indicate her interest in his questions; she may probe for the child's grasp of information by asking a

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* Material condensed from unpublished doctoral dissertation, "Teacher-Child Interaction: A Study of the Relationships between Child-Initiated Questions and Nursery School Teacher Behavior", Wayne State University, 1966.

direct or open-ended question in response. She may elect to remain silent, consciously delaying a response until the child has taken an additional step in formulating his question, experimenting on his own initiative, or turned to other resources or references. She may elect to ignore the question or in the case of nonverbal questions, wait until the child relates his inquiry in verbal form.

The present study is concerned with teacher-child interaction sequences initiated by questions posed by four-year-old children in three selected areas of program in the nursery school. Attention is focused on the relation between the act of instigation (child's question, Ci), the act of teaching (teacher's response, Tr), and the subsequent child behavior (Cr).

While no assumptions were made concerning the causal relationship between teacher behavior via a single act of teaching and the achievement product of the child, initial predictions were made about the length of the interaction sequence. The prediction was that nursery school teachers would be more inclined to extend the interaction sequence than simply to give an answer to the child's question and seemingly assume that this response was understood and satisfying to the child. Underlying this supposition was the belief that nursery school teachers are aware of young children's limited verbal skills in expressing precisely the core of their questions and, consequently, take steps to clarify their intent. A further belief was that nursery school teachers view children as active participants in the learning process and seek ways to involve them in the resolution of the problematic situation which exists in their minds.

Examination of the literature amply documents young children's great curiosity about the world in which they live and their use of questions to obtain information about people, things and events. Although the age range of the middle-income children studied by Davis (1932) and by Smith (1933) is broader than the ages of the children in the present study certain of their findings are relevant.

For example, in the home situation Davis found that the time required to collect fifty questions from each child varied considerably and concluded that the situation does not necessarily determine the rate of question asking. Boys were found to ask questions at a faster rate than girls; boys asked more questions of causal explanation, classification, and definition than girls. Girls, however, asked more questions involving social relations. Eighty-six per cent of all questions were asked of adults; eight-eight per cent of the questions seemed to result from the immediate situation as contrasted with remote events. Smith, studying children when alone with adults and when engaged in a free play situation with their peers, found that (1) 22 per cent of the recorded observations of children in the free play situation with peers contained no questions; (2) 25 per cent of the questions of four-year-olds were addressed to adults although they were actively playing in the midst of other children; (3) boys asked more questions when alone in the situations with adults but there was practically no difference in the two situations for the girls. Questions concerning human actions and intentions represented the largest number of questions and as Davis reported, the greatest number of questions were concerned with some object, action, or person either in the immediate situation or desired to be there. Further sex differences were found in relation to the content of the children's questions: (1) boys asked more causal questions and used how and why more often than girls; (2) boys asked slightly more questions involving calculations than girls; (3) girls asked more questions concerning social rules and names of places and things.

Further review of the literature reveals a paucity of studies concerned with the teaching process per se in nursery school settings, and young children's responses to various acts of teaching or teaching style. Descriptive accounts of adult attitudes or actions which support children's question-asking are plentiful. For example, Isaacs (1930) in discussing young children's interest in the physical world and mechanical causality says, "..... (to be) sustained must in large part

be a function of the environment, and of the degree of response which they meet with influential adults. If they win no help or attention, they will not be pursued or sustained". (p.82) Almy's comments are even more relevant to the present study.

> "Teachers who are interested in promoting effective thinking not only welcome questions but help children to find their own answers. They promote active discovery. Many of the inevitable 'whys' are turned back to the children in order to get their views. Then the teacher fosters experimentation to test the answers they have proposed and others that may not have occurred to them". (p.140).

Friedlander, (1965) on the other hand, draws attention to the problem of teacher inattentiveness to the needs of children to question and to explore, and teacher eagerness to supply information. He cautions against a comprehensive view of teaching and learning on the blanket assumption that children just naturally want to learn or can easily be induced to learn the things we want them to learn.

Studies concerned with older school children and their teachers, while relevant to the present study in terms of relations between teacher style and personality, classroom climate, and structure and order, tend to measure children's responses to acts of teaching in terms of achievement. The present study does not attempt to measure the adequacy or inadequacy of the teacher response by appraising the overt response of the child in terms of achievement or marked changes in behavior. It seeks to establish in descriptive terms, quantitative by decision, what child behaviors are associated with specific acts of teaching in response to the initial questions posed.

The complexities involved in developing a schema for determing the critical dimensions of each component in an interaction sequence, coupled with attempts to examine the relationships between these variables, demanded detailed analyses of the collected observations. A considered picture of the procedures involved will serve to illustrate the fallacious assumption that question-asking and question-answering is a simple, straightforward exchange between child and teacher.

Forty-six children, 24 females and 22 males, regularly enrolled in two nursery schools in an urban setting were observed with their teachers for a total of 4,525 minutes over a period of 30 school days. The Ss were between the ages of four years two months and four years eleven months, with no marked concentration at any level of the age distribution. Timed observations of individual Ss on a rotated schedule were used to obtain running written accounts of all verbal and nonverbal actions between S and teacher. All recordings occurred within the naturalistic settings of the Child-Structured Play Period (CSP), Teacher-Structured Period (TSP), and Lunch Period (LP).

All acts of instigation, i.e., S under observation initiating contact verbally or nonverbally with any adult in teacher role, were recorded. This procedure was adopted in order to follow the behaviors of all participants in the interaction episodes. A unit of interaction was defined as a gross indication of ongoing contact between the Ci (child's question) - Tr (elicited teacher response) - Cr (child's subsequent response).

Examination of individual protocols of the 46 Ss produced findings similar to those reported by Smith and Davis. For instance, one-third of the total time sample contained no child-investigated questions directed toward nursery school adults. Approximately twelve per cent of the questions posed failed to meet the definition of an information-seeking inquiry. Examples of these eliminated questions were: (1) questions disguised as statements of personal wish or demand;

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(2) a technique to secure permission to pursue own wish; (3) a way or means of acquainting teacher with his presence; and (4) a method of calling attention to the transgressions of his peers.

Problems related to the disportionate amount of observed behavior in the three selected programmatic areas of the nursery school; sex differences in acts of instigation; simple and extended child-teacher interaction sequences; and the form, content and function components of the Ci, Tr, and Cr required detailed examination. A coding system was developed subsequently for systematic analysis of the individual protocols. The system attempted to preserve the essence of direct child-teacher-child interaction as well as the couplex multi-step interaction sequence. An additional coding system extended the classification of these data to include the form (F), content (C), and function (Fu) of the acts of instigation (Ci), acts of teaching (Tr) and subsequent responses of the child (Cr).

The dynamics of an interaction sequence depend in large measure on the feelings of the participants. The extent to which any observer can determine the intent of a young child's questions to his teacher, for example, is limited by the very fact that his overt behavior per se may offer no clue or misleading clues. Agitated physical movements, facial expressions, or loud voices do not necessarily indicate the urgency or critical nature of his need for information. In turn, the observable behaviors of the recipient offer meager evidence of either her reactions to the questions or the basis for her choice of response. For the purpose of the present study it was assumed that clues to the underlying motives of both the child and teacher might be identified through careful examination of their subsequent behaviors. For example, a more accurate estimate of the real intent of a child's question may be gained if he persists in pursuing the issue involved in his original act of instigation when his teacher's initial response introduces different content or seemingly fails to satisfy his needs. An illustration of this was noted when John held up a hammer and asked, "Is this steel?" His teacher responded, "Steel is very hard." John asked, "But does a hammer have to be steel?" Teacher: "It helps."

One of the most perplexing problems encountered was the "no response" of the teacher to the child's question as well as the "no response" of the child following the teacher's act of teaching.

Taken from one position, a Tr "no response" (NR) may represent a failure to hear the question or to observe a nonverbal question. From another position, the Tr NR may present a deliberate choice, an elected act which is intended to provoke a re-formulation of the initial verbal question of the translation of a nonverbal act to a verbal question. Whether or not responses of this nature represent a positive or negative act of teaching depends upon the intent or goal of the teacher. In episodes involving such responses it is possible that these may serve as a clue to the teachers' intended act of teaching if, following the child's response the second act differs. For example, an initial teacher NR could be described as an extending act of teaching if the behavioral response of the child produced a second act of teaching obviously related to his initial question. While a child "no response" may indicate a similar "wait and see" intent or function, it may indicate as well satisfaction or dissatisfaction with the act of teaching supplied him.

The <u>form</u> (F), <u>content</u> (C) and <u>function</u> (Fu) of the question, teacher response, and subsequent response of the teacher and child were considered as being related to each other, but not necessarily required to match each other in each step of the interaction episode. There is no reason to believe, for example, that a more effective resolution to the child's verbal question is accomplished by a verbal act of teaching. On the other hand, it may be that in some episodes teachers deliberately attempt to shift content, e.g., responding to a question concerned with affective issues to content concerned with cognitive issues relating to events in the physical world. Such change or non-matching of content may be based on the teacher's effort to stimulate the child's thinking, to expose him to another aspect of the inquiry, or to re-channel his interests or activities. One interesting question in this connection is whether or not boys more frequently than girls

resist the teacher's attempt to shift content. It has been assumed that by pursuing the content through additional questions to the teacher or remarks to his peers he has not been diverted by her initial act of teaching. Insofar as the function of the child's response is concerned, there appears to be a variety of possibilities, few of which can be identified from overtly expressed behavior as satisfying or fully comprehended by the child. It does appear to the observer, however, that there is little or no basis for predicting that direct information supplied to an information-seeking question will terminate inquiry in every instance, or that such a match in form between Ci and Tr will increase the child's curiosity and lead to extension of inquiry, exploration, application, or continuing teaching-learning episodes.

Acknowledging the fact that any observer has the advantage over the teacher for concentrating on the child's behaviors prior to, during, and after the interaction episode, the question persists as to the real intent of a child's questions. If he wishes simply to contact her, alert her to the fact that he has information to share, or is testing his knowledge against facts presented by his peers, any act of teaching selected from the teachers' repertroire may serve his purpose. However, to assume that a child has learned something of interest or meaning to him without some probing or alert observation of his subsequent behaviors is to link learning to teaching as an assured fact.

The fine distinctions to be drawn between children's questions demanding clear-cut immediate answers and those inviting shared exploration of ideas and past experiences depends upon the teacher's ability to use the inquiry as a clue to the child's needs and interests. To adopt a pattern of responding immediately to a question, depending fully on the child to continue to probe for information or clarification, is to threaten his use of questions as a tool for clarifying, testing, and building up his store of knowledge and understanding about himself and the world he lives in. To respond with an answer that is beyond his reasoning abilities or to expect him to translate a cryptic or incomplete answer, e.g.,

"That's the way it is", is to deny questioning as a valued approach to problem solving. The ultimate question teachers must consider is whether or not their acts of teaching, i.e., their considered response to a question, conveys to the questioner respect for his question and his desire to learn from and with her.

Analysis of Protocols

The 650 units of interaction obtained from observing 26 Ss, 13 females and 13 males, and retained for detailed analysis yielded the following generalizations: (1) the unit of interaction resulting from a single act of instigation (Ci) in verbal or nonverbal form may result in a single child-teacher-child exchange or extended multi-step interchange; but single step units occurred two and a half times more often than two-step continuing units; (2) significant differences were found between the occurrence of single units of interaction in the three program areas under study, indicating that in the Teacher-Structured-Period factors may be operating to limit continued inquiry; (3) no significant relationships were found between the sex of the instigator, the use made of a particular mode of interaction and a particular area of the nursery school program. However, the male Ss engaged in slightly more extended units of interaction than did the female Ss; (4) the nursery school teacher emerged as the prime source of information, with peers being used infrequently as a source of information or as a resource for extending inquiry; (5) the difference between the explicit verbal form of instigation and verbal leading or extending form was highly significant. Of even greater significance was the difference between verbal forms of instigation and the nonverbal forms of child question-asking.

Based upon the analyses of the units of interaction recorded on 26 four-year-old children it appears that their nursery school teachers tend to supply explicit answers to their questions. They neither elect to verify their instantaneous grasp of the meaning of children's questions nor attempt to involve children actively in the search for answers to their own questions. It may be that they consider the

bulk of such information-seeking inquiries transitory in nature and easily satisfied. What do not emerge either from recorded observations or the analysis of the patterns of interaction are actions teachers take to assess the effects of their acts of teaching on the child. They do not appear to assume the role of learning from the child by taking cues from his response and utilize this in their next act of teaching.

PART II

The second part of the study is based on the 650 units of interaction, yielding 948 questions, 981 acts of teaching, and 980 child responses. The detailed analyses of the single components and component patterns of these variables and patterns of relationships between them are presented here in very condensed form.

By category definition 94.3 per cent of all questions posed were expressed verbally. When the explicit verbal questions (:13) were compared to verbal leading questions (:12) the difference was highly significant. Although the number of identified nonverbal questions is small, the difference between the use of the nonverbal extending questions (:121) and the nonverbal question (:131) was significant. The ambiguous and/or vague questions (:11, :10, :111, :101) appear infrequently but it is possible that this reflects failure on the part of the observers to identify question-asking behaviors of this nature.

CHILDREN'S QUESTIONS

TABLE 1

Distribution Form (F) of Children's Questions

Form Categories									Total
Verbal					Nonverbal				
	:13	:12	:11	:10	:131	:121	:111	:101	
f	529	361	3	1	10	29	10	5	948
%	55.8	38.08	.32	.11	1.05	3.06	1.05	.53	100.0

Examination of the content of children's questions revealed that the bulk of the children's questions were concerned equally with people, events and objects of their physical and social worlds. The relatively low percentage of questions defined as being focused on affective issues (seeking recognition of and response to his feelings, e.g., fears, apprehensions, preferences, reactions against delays in gratification, concern over his own social and emotional well-being) may be related to the age of the children.

TABLE 2

Distribution of Content (C) of Children's Questions

	Content Categories						Total
	Affective	Physical	Social	Symbolic	General	Indeter.	
f	123	389	358	67	3	8	948
%	12.97	41.03	37.76	7.07	.32	.84	99.99

With respect to the function of questions, the decided skew of the distribution in favor of direct information-gathering would seem to indicate that these young children in the majority of instances anticipated being supported in their inquiries with factual information. These findings suggest that by categorical definition, their questions were more precise than ambiguous. However, any generalizations to be drawn from these data must take into account the problems posed by any attempt to determine a child's intention via his overtly expressed behavior or verbal expressions.

TABLE 3

Distribution of Function Categories in Children's Questions

	Function Categories						Total
	Permission	Assist.	Eval.	Direct Info.	Extent	Indeter.	
f	66	63	81	548	176	14	948
%	6.96	6.65	8.54	57.81	18.57	1.47	100

Detailed analyses of interrelationships between components of the children's questions warrant the following summary: (1) children used an explicit verbal form of questioning in seeking information from their teachers about the physical and social world; (2) interest in the physical world versus interest in the social world did not differ significantly; (3) inconsistencies found in relation to content-function suggests that children may perceive teacher role differently with issues involving the physical world and the social world. They may view themselves as better able to cope with issues related to the physical world without first gaining teacher permission to resolve problems, than to cope without her assistance with issues involving themselves and others in aspects of their social world.

Sex Differences

As might be expected, inspection of individual protocols revealed marked intra-group differences for each sex. Table 4 illustrates inter-group similarities and differences.

TABLE 4

Distribution of Content and Form of Children's Questions

Content Categories	Females (N=13)				Males (N=13)				Total
	Verb.	Non V.	Total	%	Verb.	Non V.	Total	%	
Affective	66	13	79	14.8	38	6	44	10.7	123
Physical	194	11	205	38.3	177	7	184	44.6	389
Social	202	6	208	38.9	147	3	150	36.2	358
Symbolic	34	2	36	6.7	29	2	32	7.5	67
General	1	0	1	.20	2	0	2	.50	3
Indeter.	2	4	6	1.12	2	0	2	.50	8
Total	499	36	535	100.1	395	18	413	100.0	948
Per cent	93.27	6.73	56.43		95.64	436	43.57		

These findings not only indicate the fact that the girls asked more questions than did the boys, but illustrate as well the basis for previously reported studies in regard to interests. The t value for male Ss favoring content related to the physical world was greater than the t value favoring issues related to the physical world for the female Ss. When the percentage of questions posed by male Ss related to the physical world and to the social world were compared, a significant difference was established for the physical world content area. The difference between these two content areas for female Ss was not significant.

With respect to direct explicit questions versus leading questions and their relationship to content, the greater use by the boys of a leading question about issues of the social world suggests that they may be less precise about human actions and intentions than are the girls. They may be seeking <u>understanding</u> of the social world compared to the girls' wishes for information about it. The boys may be challenging procedures, regulations and privileges, while the direct questions of the girls could be simply to verify these facts.

Areas of Program

Significant findings were established in relation to the content of children's questions as they occurred in the Child-Structured Period, Teacher-Structured period, and Lunch Period. The greatest number of questions involving egocentric or affective issues occurred during the CSP; few questions of this nature were recorded in the TSP. Questions related to the symbolic world occurred more frequently in either the TSP or LP than in the CSP. However, when female Ss are compared to male Ss, no clear-cut indication of preferred use from one area to another was found. Questions involving the social world do not appear to be related to a specific program area.

When the function (Fu) component is isolated, there are indications that the Ss' expectations of their teachers varied from area to area. The unique quality of the program area can be illustrated by the following examples. In the TSP children appear to expect direct answers to their information-seeking questions. In the CSP and LP they appear to be instigating questions that are directed toward gaining the teacher's aid in extending inquiry. In the CSP questions are frequently directed toward gaining assistance from the teachers, while in the TSP and LP few questions of this intent are posed.

The limited use of the TSP for extending inquiry may be related to the nature of this particular situation in the schools under observation. Not only was this period more highly structured but it was more focused on the group than on the individual child. Individuals may well have less opportunity to pursue their interests when the teacher's concern is focused on the interests of all the children in the group.

Comparisons of form-content-function patterns established relationships with areas of program. The TSP appears as the area in which children are more likely to ask explicit verbal questions about the physical world; the CSP and LP appear as the program areas in which they ask verbal extending questions about the physical world.

Teacher Responses (Tr)

What the teacher says and does, or does not say or do, when a child directs a question to her has been defined as an act of teaching. Teacher competence or effectiveness is not to be judged by the extent of agreement or disagreement between the components of the acts of teaching (Tr) and the components of the child's question (Ci). It is suggested, however, that variations in patterns of teacher response may offer substantial clues to the quality of the learning climate and the dimensions of the teaching-learning episodes.

The nature of the form of response utilized by nursery school teachers in these responses may be seen in the following table.

TABLE 5

Distribution of Forms Used in Teacher Responses

	Categories of Forms									
	Verbal				Non-Verbal					
	Explicit	Extent.	Vague	Indeter.	Explicit	Extend.	Vague	Indeter.	No Response	Total
f	544	196	21	6	49	1	64	4	96	981
%	55.45	20.0	2.14	.61	5.0	.10	6.52	.41	9.77	100

The 96 "no responses" were found to occur with direct and leading or extending questions from the children and were not limited to single units of interaction. Questions related to the physical world and to the social world elicited a significantly larger per cent of "no responses" than did questions involving affective needs or causes associated with the symbolic world. There were significantly more "no responses" to questions related to the physical world than questions related to the social world.

Explanations accounting for the absence of an observable response (NR) from the teacher as discussed earlier include the possibility that the question as expressed was not heard by the teacher or that her delay was deliberate, calculated to provoke other acts of instigation directed to her, to his peers, or back to himself.

The content component of the acts of teaching was concerned primarily with the physical world (28.9 per cent) and the social world (32.4 per cent). The difference between these two categories was not significant. On the other hand, the function of the acts of teaching was decidedly in the direction of information-supplying. Of the 20 patterns identified in the form-content-function analysis, two patterns are used most frequently and approximately the same number of times: (1) explicit verbal information-supplying about the physical world and (2) explicit verbal information-supplying about issues of the social world.

Relation to sex differences

Examination of the single components and component patterns of the teacher's responses to the male and females Ss revealed significant differences. The questions of the girls about issues of their social world elicited more acts of teaching offering assistance than were offered when the boys posed such questions. Questions of the boys dealing with these issues elicited more reciprocal or leading acts of teaching. Questions about the physical world by both boys and girls elicited direct information to a far greater extent than the use of extending or leading acts of teaching for further discussion or exploration.

Relation to programatic areas

The form and content of the teachers' acts of teaching do not appear to differ markedly from area to area. Direct supplying of information about the physical and social worlds dominates in all areas. The teacher-structured period stands out as the area in which leading or extending acts of teaching occur infrequently.

Taken as a whole, i.e., form-content-function patterns, the TSP proved to differ significantly from both the CSP and LP in relation to the direct supplying of information about the physical world and the symbolic world. The CSP, by virtue of the presence of patterns there and absence of these patterns in the TSP and LP, differed significantly in acts of teaching involving the supplying of assistance around issues involving the social and physical worlds.

Child Response (Cr)

The central question raised here is not one of assessing increments of learning and understanding occurring to the child as an outcome of the teacher's act of teaching, but the nature of the influence of the Tr on the subsequent behavior of the child. The causal relationships between Tr and Cr, i.e., what the child may or may not have added to his store of knowledge or repertoire of coping skills from the preceding interaction, cannot be measured accurately. However, it is assumed that some change is more likely than not to have occurred in the child's initial act of instigation.

For the purpose of this report attention is focused on changes between the components of the Ci and the components of the Cr. For example, a comparison of Table 1 to Table 6 illustrates changes in form.

TABLE 6

Distribution of Form of Children's Responses

	Categories of Form									
	Verbal				Non-Verbal				NR	Total
	:13	:12	:11	:10	:131	:121	:111	:110		
f	468	125	22	36	218	10	36	25	39	980
%	47.76	12.86	2.25	3.67	22.24	1.02	3.67	2.55	3.98	100
Total			66.53			29.49				100

The marked increase in the number of explicit non-verbal acts of behavior (Cr :131) represents a shift in rank order of form and it seems highly possible that the teacher's acts of teaching served to satisfy the child's curiosity or directed him toward a satisfying resolution of his own question. Need for further inquiry as of the amount would be reduced and additional verbal communication with the teacher would not be forthcoming. A similar explanation may be applied to the 39 "no responses". It is of some interest to note that an explicit verbal information-supplying response about the social world from the teacher elicited more Cr :NR than any other pattern.

Table 7 serves to illustrate the marked and significant shifts in content when this component of the question is compared to the same category in the subsequent response.

TABLE 7

Comparison of Content of Ci to Cr Content

Component		Content Categories: Affect.	Physical	Social	Symbol.	General	Indeter.	No Response	Total
Ci	f	123	389	358	67	3	8	0	948
	%	12.97	41.03	37.76	7.07	.32	.85		100
Cr	f	168	267	227	39	151	89	39	980
	%	17.14	27.25	23.16	3.98	15.41	9.08	3.98	100

The marked increase in Cr content defined as involving egocentric or affective issues suggests a number of interpretations relating to the influence of the intervening variable, i.e., the teacher's act of teaching. Assuming that the Cr may carry a greater amount of ego involvement than does the Ci, this increase may be a reflected emotional response to the teacher's failure to satisfy a child's needs and interests. He may seek to establish close contact with her or to reenter her attention on him directly by making a verbal or nonverbal direct appeal. It may also be that Ss were frustrated inadvertently by the use of an open-ended Tr when the immediate need was for a prompt forthright response. If the S has insufficient knowledge or experience to bring to bear on his question his response could reflect his feelings of inadequacy and his need for reassurance.

The sharp reduction in the number of Cr involving the symbolic world may be accounted for in part by the development levels of the Ss of the sample. It is possible that at their stage of concept development they were unable to formulate additional questions about such abstractions as time, number, shape, size, etc.

Conclusions to be drawn about the function of the child's response to an act of teaching must be considered in descriptive terms rather than qualitative terms. In essense, whether or not the child appeared to be satisfied or dissatisfied with the teacher's act of teaching is secondary. What is critical is the cues he supplies the teacher and if and how she responds to these.

Whatever the intentions of the child at the point he poses a question it would seem that nursery school teachers would be more likely than not to take advantage of the opportunity to test their response against the child's subsequent behavior. For those children who posed another question or exhibited a nonverbal expressive act, the observant teacher had feedback against which to examine her act of teaching. In the case of "termination of inquiry" or "indeterminate response", is it safe to assume that the initially selected act of teaching has met the child's need? On the basis of the present findings it seems that the nursery school teachers did not view the child's subsequent behavior as a starting point for feedback. In other words, the bulk of the units of interaction were straight question-answer episodes; the function of the child's response did not serve frequently as a stimulus for probing, clarify, or extending on the part of the teacher. One may speculate that the children's limited efforts to extend inquiry via another question reflects their previous experiences with adults as prime answer-suppliers.

Sex differences

When the content of the Ci was compared to the content of the Cr, the male Ss were found to have made less shift in content involving issues of the physical world than the female Ss; the female Ss made a relatively smaller shift than did the male Ss when the content was related to the social world. In addition, male Ss appear to persist more than female Ss when their queries involve issues related to the physical world; female Ss seem to prefer termination of their interaction with teachers over extending these episodes via additional questions no matter the issues involved.

Areas of Program

The major findings among the single components and component patterns here indicate that the teacher-structured period (TSP) differs from other areas of the program in relation to form, content and function of the children's responses. For example, children seldom raised questions involved affective issues here; they seldom involved their peers in attempts to further clarify their questions of the teacher's responses; and they supplied more non-verbal clues to teachers in their responses to acts of teaching supplied.

Interaction Sequence:

Act of Instigation - Act of Teaching - Child Response

In this report the findings related to the relationships of Ci to Tr; Cr to Tr; and Ci - Tr - Cr patterns are summarized briefly.

On the basis of the data children are more likely than not to elicit matched content when the issues involved in their questions deals with the social world in the Child-Structured Period, but relatively unlikely to elicit matched content when their questions deal with issues of the physical world. They are unlikely to elicit matched content in the Teacher-Structured when their questions involve either issues related to the physical world or social world; they are highly likely to elicit matched content in these two areas if their questions occur in the Lunch Period.

Boys are more likely to elicit matched patterns involving issues of the physical world than the girls, but teachers tend to shift content from the physical world to the social world with boys more frequently than they do with girls.

The teachers tended to give more assistance to children than to offer reciprocal questions. Their major pattern of responding is to give direct verbal answers to questions asked of them.

As was anticipated, there were relatively few matched patterns from Ci - Tr - Cr, indicating that individual differences existed between the Ss. Until such time as a more precise technique is developed for interpretating the meaning (function) of a child's response to match and/or shift of the form and content of acts of teaching, no reliable conclusions can be drawn about the critical nature of these inter-relationships.

CONCLUSIONS

This study reports teacher-child interaction sequences initiated by questions posed by four-year-old children in three selected areas of program in the nursery school. Six questions are raised in order to determine the relation between the act of instigation, the act of teaching, and the subsequent child behavior. The purpose was to discover whether the teaching-learning process created by the conditions mentioned are related to: (1) the sex of the questioner: (2) the area of the program in which the question is posed; (3) the form of question and responses; (4) the content of the question and responses; (5) the function of the question and responses; (6) the combined form-content-function dimensions of any state of the child-teacher-child unit of interaction.

Thirteen girls, thirteen boys, and eight teachers in two urban nursery schools were observed for on a rotated time and program-area schedule. Verbatim recordings began at onset of verbal or non-verbal acts of instigation and continued until the subsequent steps of interaction were terminated.

A coding system was developed to permit systematic comparisons between the components of the three segments of the interaction units and patterns of interaction between children and teachers. To establish the significance of differences between per cent of use of single components and component patterns t tests were run.

The results are presented in two parts. Part one focuses on methodological problems arising from analysis of the 650 acceptable units of interaction, and reports the findings related to the interaction episodes. The second part deals with single components and component patterns of children's questions, teachers' responses, and children's subsequent responses, and with patterns of relationships between act of instigation - act of teaching - child response.

Major findings are as follows:

1. Support is found for previous investigations establishing boys' interest in phenomena of the physical world: girls' preoccupation with issues of the social world is challenged.

2. Differences emerge between the Teacher-Structured Period and both the Child-Structured-Period and the Lunch Period with response to form, content, and function of questions, acts of teaching, and subsequent responses.

3. The verbal explicit form dominates the communication between child and teacher; there is a marked decrease in extending or reciprocal questioning from the initial question to the subsequent response.

4. Children's questions involving cognitive content are less likely to elicit a "no responses" from the teacher than questions based on affective content. Boys more often elicit leading questions about the social world while girls are likely to be offered assistance when their questions involve this content.

5. The boys' persistence in pursuing their interest in the physical world is stronger than the girls' interest in following their initial questions about the social world. This finding is considered important in light of the teachers' tendency to shift content related to the physical world to content related to the social world.

This study suggests that the nursery school teachers of the sample tend to re-inforce their position as a prime verbal source of information. Their limited use of reciprocal or leading open-ended responses and restricted referral of the questioner to peers as additional sources of knowledge and interpretation, suggests that their acts of teaching are not deliberately designed to provoke divergent thinking or probing on the part of children. Teachers frequently accepted questions as they were stated, showing limited discernible evidence of the need to probe behind the child's verbal facade for meaning and gaps in understanding.

The findings indicate further the need for nursery school teachers to increase their skill in helping children learn how to learn by helping them to pose relevant questions in a more orderly sequence. Without doubt the teachers included in the present study support question-asking by children and agree that the number, kinds, and content of questions contribute to their understanding of their needs, interests, and abilities. Obviously, not all questions posed by young children require extensive detailed explanation or active investigation of all aspects of the problem. Children are no less skilled than adults in becoming "conveniently deaf" when swamped with words. At the same time, simply supplying fragments of information applicable only to the present situation tends to negate or limit active involvement in the learning process. They may learned already, or are in the process of discovering, that adults frequently not only tell them what they want to know and should know as well as what they do not particularly care about knowing. To some extent, it may be a relatively simple matter of taking time to <u>listen</u> to children's questions as opposed to thinking first of the answer to give them.

While the recorders were frequently perplexed over the words contained in a teacher-supplied answer and questioned later their possible meaning to children,

such explanations occurred in all areas under observation. For example, when asked why sand passed through the holes in a sieve and stones would not, the teacher said, "They are too heavy." During the story periods answers appeared to be supplied without pause and there were remarkably few recorded responses of a child being helped to draw relations between the answer he got and the past events in the story. Children too sometimes fail to put their questions in context when asking teachers for responses. John and Mary were having a heated discussion when Miss X joined them for lunch. John said to Miss X, "Are there square wheels?" Miss X: "Don't think so or, at least I never saw one." John, "But I saw one that looked kinda square" (Make gesture with hands as if to make his point clearer) Miss X: "You know what wheels do, don't you, John? What would happen if a wheel were square?" John to Mary, "She don't know either. I'll just show you I'm right". He leaves the table, hunts for a book, looks at it intently and returns to the table. He hands the book to Miss X and says, "Read." Miss X begins reading aloud from the book. John stands and then turns to Mary saying, "She don't read it like it is." At that point he took the book over to Mary and pointed to a picture on the page and said, "There. See?" (The picture was that of a wagon, one wheel of which was covered by grass across the bottom section) Miss X: "You're right, John. That looks like a different wheel." John made no comment but began serving himself lunch.

In addition to the limitations presented earlier, attention is called to the fact that the children observed in the study were representative of a middle-income population. One can only speculate about the nature and extent of questions of children from low-income groups. It seems very likely that inter- and intra groups differences would be found, particularly in the number of verbal questions posed to the teachers. It would be interesting to learn among other

things whether or not differences between the boys and girls persist in terms of content of their questions; if probing or extending teacher responses are used more frequently to clarify the questions and to assess the children's understanding of the supplied answer. Included in such a study or any extension of the present reported study should be an investigation of the teacher as she becomes the instigator of the interaction process as she raises questions with children. One major assumption of such a study could be that there is a relationship between the kind of questions nursery school teachers ask or present to children and their responses to the children's responses and the kinds of questions children in their group present or ask of them. It may very well be that as in other situations in the nursery school the teacher serves as an influential model in the relation of question-asking to the teaching-learning process.

As a practical outcome of the study it is suggested that teachers of young children find ways of recording children's questions and their responses to them. Their highly commendable willingness to supply explicit verbal answers to the questions, their frequently cryptic and confusing immediate answers, and questions they raise about the effect of their actions on children's curiosity may challenge them to assess their role as a learner as well as a teacher in the teaching-learning process.

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